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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
CHEN, WEN YING PATTY	

ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 12/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/749,397	YAMAMOTO, TAKESHI	
	Examiner	Art Unit	
	Wen-Ying P. Chen	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 September 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) *19* is/are withdrawn from consideration.

5)☒ Claim(s) *1-6* is/are allowed.

6)☒ Claim(s) *7-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 June 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of Group I, claims 1-18 in the reply filed on Sept. 9, 2005 is acknowledged. The traversal is on the ground(s) that no undue burden would be required. This is not found persuasive because the claimed method of forming a spacer by means of melting the spacer material stated in claim 19, as specifically pointed out by the applicant on Page 9 of the Applicant's Remark filed Jun. 29, 2005; in which the spacer as claimed in device of claims 1-18 can be formed by other methods which does not require melting of the spacer material.

The requirement is still deemed proper and is therefore made FINAL.

Claims 1-18 remain pending in the current application.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 7-9, 12-15 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Cho et al. (US 2004/0114087).

With respect to claims 7 and 13: Cho et al. disclose in Figure 12 a liquid crystal display apparatus including a liquid crystal layer (element 3) interposed between a first substrate (element 200) and a second substrate (element 100), comprising:

a first gap region (region corresponding to element 230R) with a first gap for interposition of the liquid crystal layer between the first substrate and the second substrate;

a second gap region (region corresponding to element 230B) with a second gap smaller than the first gap;

a first columnar spacer (element 323) formed in the first gap region on the first substrate; and

a second columnar spacer (element 321) formed in the second gap region on the first substrate,

wherein a dimension and volume of the first columnar spacer is greater than a dimension of the second columnar spacer (since the spacers have different heights, therefore their volumes are thus different).

As to claims 8 and 14: Cho et al. further disclose in Figure 12 that the first gap region (region corresponding to element 230R) includes a first color filter (element 230R) that mainly passes first color light, the second gap region (region corresponding to element 230B) includes a second color filter layer (element 230B) that mainly passes second color light, and the first color light has a wavelength greater than a wavelength of the second color light (Red color light has a wavelength greater than blue color light).

As to claims 9 and 15: Cho et al. further disclose in Figure 12 that the first substrate (element 200) includes, in the first gap region (region corresponding to element 230R), a first

color filter layer (element 230R) that mainly passes first color light, and includes, in the second gap region (region corresponding to element 230B), a second color filter layer (element 230B) that mainly passes second color light.

As to claims 12 and 18: Cho et al. further disclose in Paragraph 0072 that the first substrate includes a counter electrode common for all pixels.

Claims 7-9 and 13-15 are rejected under 35 U.S.C. 102(e) as being anticipated by Nishida et al. (US 6842207).

With respect to claims 7 and 13: Nishida et al. disclose in Figure 12b a liquid crystal display apparatus including a liquid crystal layer (element 4) interposed between a first substrate (element 10) and a second substrate (element 10), comprising:

a first gap region (region corresponding to element 6) with a first gap for interposition of the liquid crystal layer between the first substrate and the second substrate;

a second gap region (region corresponding to element 8) with a second gap smaller than the first gap;

a first columnar spacer (element 26) formed in the first gap region on the first substrate; and

a second columnar spacer (element 26) formed in the second gap region on the first substrate,

wherein a dimension and volume of the first columnar spacer is greater than a dimension of the second columnar spacer (Column 7, lines 1-12, wherein the spacers can be formed any where within the pixel region and thus the thickness of each of the spacers in each pixel region

wherein the color filter layer thicknesses are different are adjusted accordingly, since the spacers have different heights, therefore their volumes are thus different).

As to claims 8 and 14: Nishida et al. further disclose in Figure 12b that the first gap region (region corresponding to element 6) includes a first color filter (element 6) that mainly passes first color light, the second gap region (region corresponding to element 8) includes a second color filter layer (element 8) that mainly passes second color light, and the first color light has a wavelength greater than a wavelength of the second color light (Red color light has a wavelength greater than blue color light).

As to claims 9 and 15: Nishida et al. further disclose in Figure 12b that the first substrate (element 10) includes, in the first gap region (region corresponding to element 6), a first color filter layer (element 6) that mainly passes first color light, and includes, in the second gap region (region corresponding to element 8), a second color filter layer (element 8) that mainly passes second color light.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 10 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishida et al. (US 6842207) in view of Ochiai et al. (US 6768531).

Nishida et al. disclose all of the limitations set forth in the previous claims, but fail to disclose that the first substrate is of an active matrix substrate.

However, Ochiai et al. disclose in Figure 10 a liquid crystal display wherein the columnar spacer (element SUP) is formed on the color filter layers with different thicknesses (element FIL) on the first substrate and the first substrate further includes scan lines (Figure 1, element GL) disposed in a row direction, signal lines (element DL) disposed in a column direction, switching elements (Figure 2, element TFT) disposed near intersections of the scan lines and the signal lines, and pixel electrodes (element PX) connected to the switching elements and disposed in a matrix.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to construct a liquid crystal display having variable cell gaps formed by different thickness color filter layers having columnar spacers deposited thereon as taught by Nishida et al. wherein the columnar spacer is formed on the color filter layers with different thicknesses on an active matrix substrate as taught by Ochiai et al., Ochiai et al. teach that by forming the color filter layer along with the columnar spacer on the active matrix substrate helps to reduce the influence of the displacement of alignment of the opposing substrate, thus results in a high definition display device (Column 1, lines 34-41).

Claims 11 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishida et al. (US 6842207) in view of YI et al. (US 2003/0104291).

Nishida et al. disclose all of the limitations set forth in the previous claims and further disclose in Figure 12b that the first substrate includes a light shield layer (element 9) formed in a picture-frame shape along a peripheral edge of a display region, but fail to disclose that the first columnar spacer and the second columnar spacer and the light shield layer are formed of the same material.

However, YI et al. teach in Paragraph 0041 that the spacer and black matrix (light shield layer) can be made of the same material.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to construct a liquid crystal display as taught by Nishida et al. wherein the light shield layer and the columnar spacers are formed of the same material as taught by YI et al., since YI et al. teach that production cost can be reduced by using the same material (Paragraph 0041).

Claims 7, 12, 13 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over YI et al. (US 2003/0104291) in view of Nishida et al. (US 6842207).

YI et al. disclose in Figure 5E a liquid crystal display apparatus comprising a first substrate (element 100) including a counter electrode (element 110), liquid crystal layer interposed between a first substrate and a second substrate comprising of first and second gap regions (regions between element 118 corresponding to elements 108a-108c) and first and second columnar spacers (element 118) formed in the gap regions.

YI et al. fail to disclose that the second gap region has a second gap smaller than the first gap and that the first columnar spacer has a dimension and volume greater than a dimension and volume of the second columnar spacer.

However, Nishida et al. disclose in Figure 12b and Column 7 lines 1-12 a liquid crystal display apparatus comprising:

a first gap region (region corresponding to element 6) with a first gap for interposition of the liquid crystal layer between the first substrate and the second substrate;

a second gap region (region corresponding to element 8) with a second gap smaller than the first gap;

a first columnar spacer (element 26) formed in the first gap region on the first substrate; and

a second columnar spacer (element 26) formed in the second gap region on the first substrate,

wherein a dimension and volume of the first columnar spacer is greater than a dimension of the second columnar spacer (Column 7, lines 1-12, wherein the spacers can be formed any where within the pixel region and thus the thickness of each of the spacers in each pixel region wherein the color filter layer thicknesses are different are adjusted accordingly, since the spacers have different heights, therefore their volumes are thus different).

Therefore, it would have been obvious to one of ordinary skill in the art a the time the invention was made to construct a liquid crystal display apparatus as taught by YI et al., wherein the first gap and that the first columnar spacer has a dimension and volume greater than a dimension and volume of the second columnar spacer as taught by Nishida et al., since Nishida

et al. teach that a very good display which does not exhibit any coloring in whichever direction it is viewed can be obtained by varying the gap size of the liquid crystal layer and that the columnar spacers with different dimension and volume are provided as to maintain the different cell gaps (Abstract).

Allowable Subject Matter

Claims 1-6 allowed.

The following is an examiner's statement of reasons for allowance:

Regarding claim 1, the Prior Arts of record do not teach or suggest along or in combination that the first columnar spacer formed in the first gap region which is greater than the second gap region has a greater contact area than that of the second columnar spacer formed in the second gap region, which contacts the first substrate. Therefore, claim 1 is allowed over the cited Prior Arts.

Regarding claims 2-6, claims 2-6 depend directly or indirectly on claim 1, therefore are also allowed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

Applicant's arguments, filed 6/29/05, with respect to the rejection(s) of all claim(s) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of the Prior Art as set forth in the Office Action above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wen-Ying P. Chen whose telephone number is (571)272-8444. The examiner can normally be reached on 8:00-5:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on (571)272-2293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Wen-Ying P Chen
Examiner
Art Unit 2871

WPC 12/01/05

ANDREW SCHECHTER
PRIMARY EXAMINER